

**METHOD AND APPARATUS FOR  
PRODUCING A REFINED GRAIN STRUCTURE**

**ABSTRACT OF THE DISCLOSURE**

The apparatus for operating on a workpiece includes a die defining first and second apertures and an interior therebetween. The first aperture and the interior of the die are structured to receive the workpiece. The interior of the die can be structured to shape the workpiece into a predetermined configuration. The apparatus includes at least one rotatable pin extending at least partially into the interior of the die. The pin is structured to at least partially stir the workpiece as the workpiece moves through the interior of the die to thereby refine the grain structure of the workpiece.

CLT01/4598311v1